"The UK Advanced Tooling Grand Challenge – developing composites capability for Aerospace and critical manufacturing tooling supply chains."

The Grand Challenge

Last year, the Aerospace Technology Institute (ATI) published the **Market Spotlight**: **Growing UK Composite Capability** and convened an industry-led Composites Working Group, which has identified the UK needs to develop a high-rate automated, intelligent, and fully instrumented, supply chain for turnkey advanced tooling solutions, to satisfy demand of technology in critical manufacturing processes.

GKN Aerospace has volunteered to lead an **Advanced Tooling Grand Challenge** programme developing aerospace, and cross sector, tooling outcomes with support from an ATI strategic programme funded initiative, where relevant.

To achieve this ambition, solutions are being sought from both UK and international organisations willing to collaborate and invest to develop UK capability with support from ATI Grant Funding.

Key information

Funding Available	Grants of up to £18m matched by industry funding per organisation
Solutions Sought	Novel approaches to advanced tooling challenges at TRL3-6 from organisations of all sizes and scale
Programme Duration	Up to 3 three years, commencing January 2027
Programme Approach	An industry led, multi-partner, cross sector collaborative R&D for industry, academia, and research organisations

The Opportunity

To address the Composites Working Group's central challenge of scaling UK capability, GKN Aerospace and Challenge Owners from across the sector are inviting organisations to join the industrially led Grand Challenge programme to develop an integrated tooling capability by 2030. To achieve this ambition, solutions are being sought from both UK and international organisations willing to locate and invest in developing UK capability.

The focus of the programme will be to collaborate on an application for ATI funding in 2026, and, upon successful funding, engage in a sprint project, of up to three-year collaboration from 2027 to develop and demonstrate both technology and capability to meet the Tooling Challenges in the UK by 2030.

Challenge areas (extracted from the upcoming ATI Composites Strategy)

Solution Providers should consider the list of potential use cases when putting forward an interest, while not intended as an exhaustive list these use cases address known gaps in UK capability.

The output of the programme will focus on collaborative demonstration of the core technologies as well as supporting process, methods, and tools.

Outcomes demonstrated from the programme must target at least TRL5-6 and show clear route to market that ensure viable business cases and continued support.

- ***Alternative Materials for CTE equivalence*** – Exploring the use of substitute materials designed to match the coefficient of thermal expansion (CTE) requirements, to enhance compatibility and performance within composite tooling applications.
- ***Design and Simulation Methods and Tools for Right-First-Time Tooling*** – Developing and applying advanced design and simulation techniques to achieve precise tooling results on the first attempt, minimising costly rework and optimising production efficiency.
- ***Re-usable and Re-configurable Tooling*** – Investigating approaches for creating tooling that can be reused or easily reconfigured, supporting flexible manufacturing processes and reducing waste.
- ***Intelligent Tooling for Advanced Composite Processing*** – Integrating intelligent features within tooling systems to facilitate advanced composite processing, enabling enhanced monitoring and adaptive control during production.
- ***Novel Sensing for Process Control*** – Implementing new sensing technologies to improve process control, ensuring quality, consistency, and reliability in composite manufacturing operations.
- ***Integrated heating and cooling for large scale and high integrity*** – Designing tooling with embedded heating and cooling systems to maintain optimal conditions for large-scale composite production, ensuring structural integrity and uniformity.
- ***Multi-Material Tooling for Enhanced Quality and Durability*** – Using a combination of materials within tooling solutions to achieve superior quality and durability, tailored to the demands of composite manufacturing.
- ***Vacuum Integrity of Complex Multi-Split Tools*** – Addressing the vacuum integrity challenges associated with complex, multi-split tooling configurations, essential for high-quality composite part production.

- ***Advanced Machining and Metallic Joining Technologies*** – Exploring innovative machining techniques and metallic joining methods to improve tooling performance and longevity in composite applications.
- ***Tool coatings and injected finishes, alternative to PFAS – REACH compliant*** – Developing tool coatings and injected finishes that provide effective alternatives to PFAS, ensuring compliance with REACH regulations and promoting safer manufacturing practices.
- ***Rapid response tooling manufacturing methods*** – Implementing rapid manufacturing methods to enable quick response in tooling production, supporting dynamic and flexible composite manufacturing environments.
- ***Metamaterials in Tooling Applications*** – Investigating the use of metamaterials within tooling applications to unlock new properties and functionalities for composite production.
- ***Automation and Integration of Tooling Operations: Tooling as a System*** – Advancing the automation and integration of tooling processes, viewing tooling as a holistic system to streamline operations and improve overall manufacturing outcomes.

Context of the Tooling Grand Challenge

We are pleased to invite interests for an upcoming programme to enable advanced tooling supply chain for critical composites manufacturing

- The vision developed by the ATI Composites Working Group is for the UK to have an integrated local supply chain for composite tooling, capable of delivering the design and manufacturing of tools required to support advanced, high-rate processing of aerospace composite components.
- This capability helps retain critical intellectual property and technical know-how within the country, thereby enhancing the competitiveness of the UK aerospace industry.
- To address the UK opportunity GKN Aerospace, and leading Challenges Owners from the composites sector, are launching a Grand Challenge programme to develop and demonstrate the technologies needed by 2030.
- High-rate manufacturing processes demand tooling that is active, intelligent, fully instrumented, and automated. Such tooling must support real-time data analysis and in-line correction of the curing profile to enhance quality, reduce cycle times, and minimise waste.

To achieve these key milestones GKN Aerospace are seeking Solution Providers to support and enable the downstream development and industrialisation of future aerospace products in a large scale, ATI Funded Grand Challenge programme.

What are we looking for?

- Solutions proposed should target aerospace sector results that deliver UK capability as well as the technology required to meet future demand.
- Cross-sector solutions which when integrated could also result in capacity for cross sector application in defence, automotive, energy and marine sector are welcome.
- Outputs of the programme which focus on collaborative demonstration of the core technologies as well as supporting process, methods, and tools.
- Outcomes demonstrated from the programme must target at least TRL5-6 and show clear route to market that ensure viable business cases and continued support.

The ATI Application Timeline

- **Funding Application** consisting of two stages, this and subsequent stages will be funded on a shared cost basis from May until December 2026:
  - **Outline Submission** to the Aerospace Technology Institute strategic programme.
  - **Full Stage Application** including Interview stage for the Batch 50 submission of October 6th, 2026.
- **Contracting Phase** Develop and support the Consortium through the with the Funding Stakeholders from ATI and Innovate UK.
- **Delivery Phase** Deliver and support the Consortium through to provide Programme Management and Dissemination support during the term of the Grand Challenge Programme.

Ways to Engage

The Composites UK Tooling Event on March 24th

- Come along to meet GKN Aerospace and the Programme team and discuss challenges in scope.
- There will be a dedicated session to hear about the Grand Challenge and what it means to UK industry.

The Online Briefing Event on 31st March 2026

- A briefing event will be held to offer insight into the central challenges, discuss clarifying questions or general requests on the approach where GKN Aerospace and Challenge Owners will provide an overview of the opportunities and challenges to be addressed.
- Following the event questions can also be submitted directly to the Grand Challenge Programme briefing with clarifying questions covering technical, procedural, or commercial aspects.

Expression of Interest to be submitted no later 5.0 pm, April 9th, 2026

Expressions of interest must be no more than six pages or six slides in length and must be completed in the template provided here, and which covers the following areas:

Organisation	Contact name, organisation details and contact number.
Scope	Describe how the solution aligns to the challenge scope.
Innovation	Describe the innovation and technology intended to be delivered in the project, along with novel outcomes that will be generated or where existing, can be used.
Demonstrators	Describe the project outcomes and their impacts in the context of the Challenge and the market opportunity it will address
Timescale	Summarise how your will be achieved within the project duration. Challenges may be of between 3 months and 3 years but must have tangible outcomes for monitoring purposes.
Matched Funding	Provide confirmation that your organisation can contribute to the shared cost of the application phase and will provide match funding once a successful application has been confirmed.
Team	Summary of your organisation's expertise and online profile or web page.
Availability	Confirmation that a representative from the Team will be available to attend the Solution Provider Workshop on April 16th at GKN Aerospace, Global Technology Centre in Filton Bristol.
Invitation Only	Organisations which are successful in the Expression of Interest process will be invited to meet Challenge Owners at the GKN Global Technology Centre

The Solution Provider Workshop on 16th April 2026

- Organisations which are successful in the Expression of Interest process will be invited to meet Challenge Owners at the GKN Global Technology Centre for a Solution Provider Workshop 16th April – please keep this date free.

- This event will provide Solution Providers to meet Challenge Owners and Programme team and discuss the Grand Challenge proposal and address any follow up questions on the solutions your organisation can contribute.
- Following the Solution Provider Workshop a final decision will be made on the consortium partners to take forward into the formal stages of the ATI strategic programme.

Eligibility and Confidentiality

- The consortium is open to sole innovators, industry, academic and research organisations of all types and sizes. International organisations looking to locate and invest in the programme are welcome to engage.
- All information you provide to us as part of your proposal, whether submitted directly or through the workshop process, will be managed in confidence, please though ensure that no proprietary information is shared.
- By submitting your EOI you are confirming your organisation's unqualified acceptance of these terms and conditions. For successful expressions of interest Non-Disclosure and commercial terms are covered below.

Non-Disclosure:

- All consortium members will be required to sign a multi-partner Non-Disclosure agreement before joining the consortium.
- In line with ATI requirements a consortium level Collaboration Agreement will be agreed upon submission of the Full Stage Application and executed on receipt of the Grant Offer Letter.

Commercial Terms:

GKN Aerospace has appointed Axillium Research and Composites UK as independent Advisors to develop and support the Tooling Grand Challenge from conception until the completion of the execution of the Grant Funded delivery of the programme.

- Commercial services will be engaged directly via Axillium Research as an independent shared service to each organisation within the consortium.
- In their capacity as independent Advisors, Axillium Research & Composites UK will provide the services for support to all Consortium Members for the ATI Funding Application.
- Shared service costs will based on business size in line with current UK definitions of large, small, and medium sized enterprises. Academic and Research Technology Organisations will be treated as large enterprises.

Service Costs

- Shared service costs will based on business size in line with current UK definitions of large, small, and medium sized enterprises. Academic and Research Technology Organisations will be treated as large enterprises.
- Commercial services will be engaged directly via Axillium Research as a shared service to each organisation.

Contacts:

- Axillium Research Info@axillium.com
- Composites UK Info@compositesuk.co.uk

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